Claims

1. A clock, with a mechanical, electrical or electronic motor, with analog and unambiguous 24 hour display, with at least one indicating element for the hours, which is driven by an hour tube (18), characterised in that

   - the indicating element (5) for the hours runs around a two-loop closed curve (7, 31), called a conchoid or Pascal snail, of which each point is touched exactly once in 24 hours by the indicating element (5), whereby the said curve (7, 31) has an outer loop (8, 40) and an inner loop ((9,41) with a crossing point (42) of the two loops (8, 40; 9, 41),
   - means are present to guide the indicating element (5) along the said two loop curve (7, 31),
   - the angular position of the indicating element (5) with regard to the null points of time at 12 h and 24 h is that as in known clocks.

2. A-clock according to Claim 1, characterised in that the means by which the, indicating element is guided along the said two loop curve (7, 31) comprise the following elements,

   - a groove, at least indirectly connected to the dial (24), which is also formed as a two loop closed curve in the shape of a conchoid (10),
   - a guiding element (12, 17), which can move along in the said conchoid (10) and carries a guide pin (21)
   - an element (11, 14) firmly fixed to the hour tube (18), which moves the guiding element (12, 17) in the conchoid (10) at, least indirectly,
   - an indicating element (13), which is moved in a radial direction by the guide pin (21), and in the azimuthal direction by the element (11, 14) firmly fixed to the

hour tube (18).

3. A clock according to Claim 2, characterised in that

- a variable length hour hand (5) is present with an inner part (14) and an outer part (13), whereby the inner part (14) can be joined to the element firmly joined :o the hour tube (18),
- the outer part (13) of the hour hand (5) can be slid in a radial direction relative to the inner part (14) and is moved by it in an azimuthal direction,
- the radial movement of the outer part (13) of the hour hand (5) is caused by the guide pin (21), which is at least indirectly in connection with the said outer part (13),
- the indicating element is the point o the outer part (13) of the hour hand (5).

4. A clock according to Claim 3, characterised in that the guiding element, which carries the guide pin (21), is a sickle shaped sliding element (12), which can move azimuthally with radial play in the groove formed conchoid (10), whereby outer radius of curvature of the sickle shaped sliding element (12) is smaller than the smallest radius of curvature of, the outer surface of the groove-shaped conchoid (10), and the inner radius of curvature of the sickle shaped sliding element (12) is greater than the greatest radius of curvature of the inner surface of the groove-shaped conchoid (10).

5. A clock according to Claim 3, characterised in that

- the guiding element, which carries the guide pin (21) is a guiding element (17) with at least three wheels (26, 27, 28) with parallel axles perpendicular to the plane of the dial (24), with two arms (29), further a carrying member (25) is present, in which the three said wheels (26, 27, 28) are mounted, whereby each of

the two arms (29) carries one wheel (26, 28), and the third wheel (27) is mounted between the two wheels (26, 28) in the carrying member (25),

- the wheels (26, 27, 28) are arranged behind one another in the direction of the track of theconchoid (10), so that the first and the third wheel (26, 28) can touch the inner surface of the conchoid (10) and the centre wheel (27) the outer surface of the conchoid (10),
- the three wheels aforesaid are further arranged so that both at the position in the conchoid (10) with the greatest, and also in that with the smallest radius of curvature, sufficient radial play is available so as to facilitate easy aximuthal movement of the guiding element (17),
- the guide pin (21) is arranged in the region of the centre wheel (27).

6. A clock according to Claim 5, characterised in that of the arms (29) between the centre wheel (27) and the outer wheels (26, 28) at least one is produced as a flexing spring (30) working in a radial direction.

7. A clock according to Claim 1, characterised in that the means for guiding the indicating element on the said two loop curve (7, 31), comprise gear wheels and the arms necessary to carry them.

8. A clock according to Claim 7, characterised in that

- the means for guiding the indicating element on the said two loop curve (7, 31), comprise the following elements,
  - a first gear wheel (A), with radius r(A), which is arranged concentrically with the hour tube (18) with radius r(18) and is firmly connected at least indirectly to the dial (24),

- a first arm (32) firmly connected to the hour tube (18) and extending outwards, in which a first axle (36) of a second gear wheel (B) with radius r(B) is rotatably mounted,
- the second gear wheel (B) lies in the same plane as the first gear wheel (A) and meshes with it,
- a third gear wheel (C) with radius r(C) is present and arranged concentrically with the second gear wheel (B) and is firmly connected to the first arm (32), a second arm (34) is present and similarly fastened to the second gear wheel (B) on the same axle,
- a fourth gear wheel with radius r(D1) is present, which lies in the same plane as the third gear wheel (C) and meshes with it,
- the fourth gear wheel (Dl) is fastened on an axle (33) running parallel to the axle (36), which is mounted rotatably in the second arm (34),
- the second arm (34) carries an axle (35) at a distance d. (E) from the axle (36) , to which it is fastened, running parallel to it
- a fifth gear wheel (E) is present, which can rotate about the last named axle (35) and at a distance d(F) from this carries the guide pin (21) arranged parallel to it,
- a sixth gear wheel (D2) with radius r(D2) is present, which is arranged in the same plane as the fifth gear wheel (E) and meshes with it, whereby the sixth gear' wheel (D2) is fastened on the same axle (33) as the fourth gear wheel (D1), coaxial with it,
- the following relationships apply for the radii r(A), r(B), r(c), r(D1), r(D2):

$$r(B) = 2r(A)$$

$$r(C) = 2r(Dl)$$

$$r(E) = r(D2).$$

9. A clock according to Claim 8, characterised in that

- the crossing point (42) of the two loops (40, 41) of the two loop curve (31) has a distance d(31) from the centre of the hour tube (18) whereby

  $$r(A) + r(B = d(31)$$

  applies,

- the greatest radial distance of each of the two loops (40, 41) of the two loop curve (31) amounts to d(40) or d(41) and is connected to the distances d(E) and d(F) in accordance with the following equations:

  $$d(E) = d(F)$$

  $$d(40) \quad d(41) = 4d(E),$$

- the hour tube (18) has an outer radius r(18), which together with r (A), r (B) , and r (C) define the limitation that

  $$r(C) < r(A) + r(B) - r(18).$$

10. A clock according t0 Claim 3 and Claim 7, characterised in that

- the element firmly joined to the hour tube (18) is a disc (11) arranged, concentrically to it,

- a variable length hour hand (5) is present with an inner part (14) and an outer part (13), whereby the inner part (14) can be joined to, the disc (11),